

Analysis Results - Random Forest

importance_mean
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50.84426299526842
2.6438038099601426
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0.05063161188126839
0.032886791438989836
0.032060996810868346
0.03056340705840428
0.029349004242134605
0.02798803407414961
0.026562974312877703
0.024614078587262073
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0.02257832785847332
0.022521089049045845
0.022074733649940198
0.021857912251229444
0.02070007380485003
0.020177533667539063
0.02007517234062996
0.019177312634512587
0.01832240603984556
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0.01627390386900517
0.01613300920554246
0.015663709236423205
0.014860215531202614
0.014197206038156098
0.01403072053452168
0.013751564255119553
0.010807815343500995
0.00989537659667957
0.005041898146437193

Pre-Modeling Statistics

Feature	Pearson r	Pearson FDR	Spearman rho	Spearman FDR	ANOVA F	ANOVA FDR	Sig?
PLOT	-0.3602	0.0000	-0.2762	0.0000	58.3020	0.0000	Yes
ENV_SOILNH4	0.0948	0.0712	0.2332	0.0000	3.5459	0.0712	Yes
ENV_SOILNO3	0.0490	0.3658	0.1557	0.0023	0.9414	0.3658	Yes
ENV_SOILP	0.2086	0.0000	0.1279	0.0127	17.7800	0.0000	Yes
ENV_SOILOC	0.4799	0.0000	0.4664	0.0000	117.0170	0.0000	Yes
ENV_SOILTN	0.4810	0.0000	0.4640	0.0000	117.6691	0.0000	Yes
ENV_SOILTC	0.4838	0.0000	0.4658	0.0000	119.4975	0.0000	Yes
ENV_PH	-0.0175	0.7289	-0.0393	0.4651	0.1203	0.7289	No
ENV_SOILCLAY	0.3526	0.0000	0.3511	0.0000	55.5275	0.0000	Yes
ENV_SOILSILT	0.4335	0.0000	0.4026	0.0000	90.4940	0.0000	Yes
ENV_SOILSAND	-0.4135	0.0000	-0.3816	0.0000	80.6270	0.0000	Yes
ENV_SOILMOIS	0.4648	0.0000	0.4496	0.0000	107.7234	0.0000	Yes
COVER_RICHNESS_JUN	-0.1236	0.0180	-0.2224	0.0000	6.0689	0.0180	Yes
COVER_TOTAL_JUN	0.3246	0.0000	0.3628	0.0000	46.0578	0.0000	Yes
COVER_SHANNON_JUN	-0.1289	0.0139	-0.2211	0.0000	6.6112	0.0139	Yes
COVER_RICHNESS_JUL	-0.0952	0.0712	-0.1762	0.0005	3.5783	0.0712	Yes
COVER_TOTAL_JUL	0.3040	0.0000	0.4258	0.0000	39.8262	0.0000	Yes
COVER_SHANNON_JUL	-0.0290	0.5844	-0.1081	0.0354	0.3289	0.5844	Yes
COVER_RICHNESS_AUG	-0.1788	0.0005	-0.2615	0.0000	12.9125	0.0005	Yes
COVER_TOTAL_AUG	0.3803	0.0000	0.4278	0.0000	66.1066	0.0000	Yes

COVER_SHANNON_AUG	-0.1623	0.0017	-0.2305	0.0000	10.5809	0.0017	Yes
LAT	0.3925	0.0000	0.2620	0.0000	71.1924	0.0000	Yes
LONG	0.3863	0.0000	0.2380	0.0000	68.5667	0.0000	Yes
PASTURE_TOTALAREA	-0.3975	0.0000	-0.3756	0.0000	73.3916	0.0000	Yes
SUBPASTURE_TOTALAREA	-0.3140	0.0000	-0.3013	0.0000	42.7582	0.0000	Yes
PASTURE_FORESTAREA	0.2970	0.0000	0.2509	0.0000	37.8304	0.0000	Yes
PASTURE_WETLANDAREA	-0.0718	0.1766	0.0063	0.9004	2.0286	0.1766	No
ENV_AIRTEMP	0.0357	0.5115	-0.0067	0.9004	0.4987	0.5115	No
GH_COUNT	-0.3535	0.0000	-0.3948	0.0000	55.8253	0.0000	Yes
PC_HEIGHT	0.5451	0.0000	0.5156	0.0000	165.2833	0.0000	Yes
ENV_PROBEMOIS_AUG	0.5002	0.0000	0.4429	0.0000	130.4838	0.0000	Yes
ENV_PROBEMOIS_JUL	0.3403	0.0000	0.2940	0.0000	51.1940	0.0000	Yes
ENV_PROBEMOIS_JUN	0.2328	0.0000	0.2335	0.0000	22.4076	0.0000	Yes

Permutation Importance

Feature	Mean	SD
PC_HEIGHT	0.1815	0.0811
SUBPASTURE_TOTALAREA	0.0530	0.0267
ENV_PROBEMOIS_JUN	0.0157	0.0110
COVER_RICHNESS_JUL	0.0138	0.0104
LONG	0.0105	0.0100
COVER_TOTAL_JUL	0.0096	0.0132
PLOT	0.0091	0.0041
PASTURE_TOTALAREA	0.0081	0.0117
COVER_TOTAL_JUN	0.0072	0.0114
COVER_SHANNON_JUN	0.0060	0.0048
COVER_RICHNESS_AUG	0.0056	0.0088
COVER_RICHNESS_JUN	0.0047	0.0030
LAT	0.0045	0.0012
PASTURE_FORESTAREA	0.0034	0.0111
COVER_TOTAL_AUG	0.0026	0.0113
ENV_SOILMOIS	0.0025	0.0121
ENV_SOILNO3	0.0024	0.0004

ENV_AIRTEMP	0.0021	0.0040
COVER_SHANNON_JUL	0.0017	0.0013
PASTURE_WETLANDAREA	0.0016	0.0047
COVER_SHANNON_AUG	0.0014	0.0079
ENV_SOILCLAY	0.0002	0.0030
ENV_SOILNH4	-0.0000	0.0067
ENV_PH	-0.0003	0.0003
ENV_SOILTN	-0.0012	0.0024
ENV_SOILP	-0.0013	0.0192
ENV_SOILOC	-0.0025	0.0061
ENV_PROBEMOIS_AUG	-0.0043	0.0407
ENV_SOILTC	-0.0045	0.0122
ENV_PROBEMOIS_JUL	-0.0061	0.0054
ENV_SOILSILT	-0.0144	0.0157
GH_COUNT	-0.0186	0.0150
ENV_SOILSAND	-0.0188	0.0247

SHAP Values

Feature	Mean Abs
PC_HEIGHT	3.4051
COVER_TOTAL_JUL	1.0292
ENV_PROBEMOIS_AUG	0.7705
ENV_SOILMOIS	0.4773
COVER_TOTAL_AUG	0.4086
COVER_RICHNESS_AUG	0.3694
GH_COUNT	0.3585
PASTURE_TOTALAREA	0.3453
ENV_SOILTC	0.2734
COVER_TOTAL_JUN	0.2639
ENV_SOILP	0.2598
COVER_SHANNON_JUN	0.2401
ENV_SOILTN	0.2353
COVER_RICHNESS_JUL	0.2221

COVER_SHANNON_AUG	0.2190
SUBPASTURE_TOTALAREA	0.2145
ENV_SOILSAND	0.2045
ENV_SOILSILT	0.2038
LONG	0.2035
COVER_SHANNON_JUL	0.1782
COVER_RICHNESS_JUN	0.1563
ENV_PH	0.1390
PASTURE_FORESTAREA	0.1346
ENV_AIRTEMP	0.1285
LAT	0.1261
ENV_SOILOC	0.1207
PLOT	0.1206
ENV_PROBEMOIS_JUL	0.1067
ENV_SOILNO3	0.0887
ENV_PROBEMOIS_JUN	0.0873
ENV_SOILNH4	0.0826
PASTURE_WETLANDAREA	0.0630
ENV_SOILCLAY	0.0579

Per-Split Model Metrics

Split	R ²	MSE
	0.5417	54.2708
	0.3368	47.8353
	0.1707	50.4267
Mean ± SD	0.3497 ± 0.1517	50.8443 ± 2.6438